



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/912,452	07/26/2001	Jiang Shen	57042-050	4453
20277	7590	11/19/2004		
MCDERMOTT WILL & EMERY LLP 600 13TH STREET, N.W. WASHINGTON, DC 20005-3096			EXAMINER WARE, CICELY Q	
			ART UNIT 2634	PAPER NUMBER

DATE MAILED: 11/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

42

<b>Office Action Summary</b>	Application No. 09/912,452	Applicant(s) SHEN, JIANG	
	Examiner Cicely Ware	Art Unit 2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 July 2001.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 8-11 is/are allowed.
- 6) ☒ Claim(s) 1-5, 7, 12 is/are rejected.
- 7) ☒ Claim(s) 6 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>1</u> .   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Specification*

1. The abstract of the disclosure is objected to because:
  - a. Pg. 20, examiner suggests applicant delete the top line of this page  
Correction is required. See MPEP § 608.01(b).
  - b. Pg. 20, lines 5-6, applicant uses the phrase "filter in accord with".  
Examiner suggests using "filter in accordance with" for clarification purposes.
2. The disclosure is objected to because of the following informalities:
  - a. Pg. 6, lines 21-20, applicant uses the phrase "filter in accord with".  
Examiner suggests using "filter in accordance with" for clarification purposes. Applicant uses "accord" throughout the disclosure. Examiner suggests applicant correct all instances for clarification purposes.
  - b. Pg. 6, line 24, applicant uses the phrase "implemented in accord with".  
Examiner suggests using "implemented in accordance with" for clarification purposes.  
Appropriate correction is required.
3. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

***Claim Objections***

4. Claims 1, 3, 5, 11, and 12 are objected to because of the following informalities:
  - a. Claim 1, lines 1 and 13, applicant uses the phrase "stream in accord with". Examiner suggests applicant use "stream in accordance with" for clarification purposes. Applicant uses "accord" throughout the claims. Examiner suggests applicant correct all instances for clarification purposes.
  - b. Claim 1, line 3, applicant uses the phrase "of one or more one or more". Examiner suggests applicant delete the second instance of "one or more" for clarification purposes.
  - c. Claim 1, line 5, applicant uses the phrase "comprising a one or more samples". Examiner suggests applicant use "comprising one or more samples".
  - d. Claim 3, lines 1 and 10, applicant uses the phrase "stream in accord with". Examiner suggests applicant use "stream in accordance with" for clarification purposes.
  - e. Claim 5, lines 1, applicant uses the phrase "stream in accord with". Examiner suggests applicant use "stream in accordance with" for clarification purposes.
  - f. Claim 5, line 9, applicant uses the phrase "filter in accord with". Examiner suggests using "filter in accordance with" for clarification purposes.
  - g. Claim 11, line 1, applicant uses the phrase "signal in accord with". Examiner suggests using "signal in accordance with" for clarification purposes.
  - h. Claim 12, line 5, applicant uses the phrase "stream in accord with". Examiner suggests using "stream in accordance with" for clarification purposes. Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sim (US Patent 5,825,809) in view of Gandhi et al. (US Patent 6,112,218) (cited by applicant).

(1) With regard to claim 1, Sim discloses in (Fig. 1 and Fig. 5) a method of digital filtering of a digitized input stream in accordance with a predetermined filter function approximating a sum of products of a series of one or more first coefficient values and a series of one or more delayed samples from a digital output stream added together with a sum of products of a series of one or more second coefficient values and a series comprising one or more samples from the digital input stream, the digital filtering method comprising the steps of; scaling (Fig. 1 (13) each of the plurality of respective numeric input values by a different power of a base numeric value for the digital filtering, to form a respective one of a plurality of scaled values; and adding (Fig. 1 (17), Fig. 5 (67)) the scaled values together to form the digital output stream in accordance with the predetermined filter function (col. 1, lines 44-61, col. 3, lines 38-40, col. 4, lines 1-7, 15-29).

However Sim does not disclose combining predetermined sets of one or more samples from the digital input stream and one or more samples from the digital output stream, to form a plurality of respective numeric input values.

However Gandhi et al. discloses in (Fig. 3) combining predetermined sets of one or more samples from the digital input stream and one or more samples from the digital output stream, to form a plurality of respective numeric input values (col. 1, lines 53-60, col. 4, lines 50-61).

Therefore it would have been obvious to one of ordinary skill in the art to modify Sim to incorporate combining predetermined sets of one or more samples from the digital input stream and one or more samples from the digital output stream, to form a plurality of respective numeric input values in order to provide a digital filter with a recursive path in which reduced precision adder circuitry can be utilized without increasing quantization error (Gandhi et al., col. 5, lines 10-12).

(2) With regard to claim 2, claim 2 inherits all the limitations of claim 1. Sim further discloses wherein the base numeric value is 2, and the step of scaling comprises shifting each respective numeric input value by a different number of bit positions, so as to scale their respective numeric input value by a different power of 2 in order to allow for when the energy level of the signal input to a digital filter varies at most once in a filter window (col. 4, lines 1-7, 15-29).

(3) With regard to claim 3, claim 3 inherits all the limitations of claim 1.

(4) With regard to claim 4, claim 4 inherits all the limitations of claim 3. Gandhi et al. further discloses where in the means for combining, the means for scaling, and the

means for adding are implemented in a digital signal processor in order to incorporate programmable coefficients (col. 5, lines 22-25, col. 8, lines 46-60).

(5) With regard to claim 5, Sim discloses in (Fig. 1) a digital filter for processing samples of a digital input stream in accordance with a predetermined filter function comprising: a plurality of scalers (13), each for scaling a respective input sample value by a different power of a base numeric value to form a respective scaled value; and an adder (17) coupled to outputs of the scalers for totaling the respective scaled values to form the digital output stream of the digital filter in accordance with the predetermined filter function (col. 4, lines 1-7, 15-29).

However Sim does not disclose one or more combining circuits, for combining predetermined sets of one or more samples from the digital input stream with one or more samples from a digital output stream of the digital filter, to form respective input samples values for input to the scalers.

However Gandhi discloses (Fig. 3) one or more combining circuits, for combining predetermined sets of one or more samples from the digital input stream with one or more samples from a digital output stream of the digital filter, to form respective input samples values for input to the scalers.

Therefore it would have been obvious to one of ordinary skill in the art to modify Sim to incorporate one or more combining circuits, for combining predetermined sets of one or more samples from the digital input stream with one or more samples from a digital output stream of the digital filter, to form respective input samples values for input to the scalers in order to provide a digital filter with a recursive path in which reduced

precision adder circuitry can be utilized without increasing quantization error (Gandhi et al., col. 5, lines 10-12).

(6) With regard to claim 7, claim 7 inherits all the limitations of claim 5. Sim further discloses wherein the base numeric value is 2, and the step of scaling comprises shifting each respective numeric input value by a different number of bit positions, so as to scale their respective numeric input value by a different power of 2 in order to allow for when the energy level of the signal input to a digital filter varies at most once in a filter window (col. 4, lines 1-7, 15-29).

7. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sim (US Patent 5,825,809) in combination with Gandhi et al. (US Patent 6,112,218) (cited by applicant) as applied to claim 1 above, and further in view of Batalama et al. (US Patent 6,078,573).

With regard to claim 12, claim 12 inherits all the limitations of claim 1 above. Sim in combination with Gandhi et al. disclose all the limitations of claim 1 above. Gandhi et al. further discloses

However Sim in combination with Gandhi et al. do not disclose a wireless spread-spectrum receiver comprising: an antenna for receiving a wireless spread-spectrum signal; an analog to digital converter coupled to the antenna for converting the received wireless spread-spectrum signal to a digital input stream; and a direct sequence spread spectrum demodulator coupled to the digital filter processing the digital output stream to recover data or signaling information.



However Batalama et al. discloses in (Fig. 4) a wireless spread-spectrum receiver comprising: an antenna (101) for receiving a wireless spread-spectrum signal; an analog to digital converter (103) coupled to the antenna for converting the received wireless spread-spectrum signal (104) to a digital input stream; and a direct sequence spread spectrum demodulator (102) coupled to the digital filter processing the digital output stream to recover data or signaling information (abstract, col. 1, lines 13-27, col. 2, lines 59-62, col. 6, lines 21-29, col. 8, lines 51-61).

Therefore it would have been obvious to one of ordinary skill in the art to modify the inventions of Sim in combination with Gandhi et al. to incorporate a wireless spread-spectrum receiver comprising: an antenna for receiving a wireless spread-spectrum signal; an analog to digital converter coupled to the antenna for converting the received wireless spread-spectrum signal to a digital input stream; and a direct sequence spread spectrum demodulator coupled to the digital filter processing the digital output stream to recover data or signaling information to provide for the detection of binary antipodal signals in the presence of unknown spread-spectrum multiuser interference and additive white Gaussian noise (Batalama et al., col. 3, lines 60-64).

***Allowable Subject Matter***

8. Claim 6 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: The instant application discloses a method of

Art Unit: 2634

digital filtering of a digitized input stream in accordance with a predetermined filter function. Prior art references show similar methods but fail to teach a first multi-tap delay line, coupled to receive the digital input stream, for supplying predetermined samples from the digital input stream to the one or more combining circuits; and a second multi-tap delay line, coupled to an output of the adder, for supplying predetermined samples from the digital output stream to the one or more combining circuits.

9. Claims 8-11 are allowed.

10. The following is a statement of reasons for the indication of allowable subject matter: The instant application discloses a method of digital filtering of a digitized input stream in accordance with a predetermined filter function. Prior art references show similar methods but fail to teach **"a plurality of combining circuits, each combining circuit for combining a predetermined set of samples from the digital input stream and samples from a digital output stream of the digital filter, to form a respective input sample value for the input to one of the scalars"**, as in claims 8; and **"scaling combinations of specific ones of the N received and delayed samples of the input signal and specific samples from a predetermined number M of delayed output signals, by respective scaler values and combining respective scaled values so as to produce output signals by approximating the digital filter function"**, as in claim 11.

**Conclusion**

11. The prior art made record and not relied upon is considered pertinent to applicant's disclosure:

a. McDonough US Patent 5,629,955 discloses a variable spectral response FIR filter and filtering method.

b. Miya et al. US Patent 5,757,870 discloses a spread spectrum communication synchronizing method and its circuit.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cicely Ware whose telephone number is 571-272-3047. The examiner can normally be reached on Monday – Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 571-272-3056. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

*Cicely Ware*

cqw  
October 29, 2004

  
AMANDA L. LE  
PRIMARY EXAMINER